Arctic 3G Gateway User Manual

Arctic 3G Gateway (2622)

Firmware Version 2.1.x
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(according to ISO/IEC Guide 22 and EN 45014)

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Manufacturer's Address:

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declares that this product:

Product Name:

Arctic 3G Gateway

conforms to the following standards:

EMC:

EN 55022 Emission Test (Class A)

1. Radiated Emissions (30-1000MHz)
2. Conducted Emissions (0.15-30MHz)

EN 50082-1 Immunity Test

1. IEC 801-3: Radio Frequency Electromagnetic Field
2. IEC 801-2: Electrostatic Discharge
3. IEC 801-4: Fast Transients, AC Power Ports and Signal cables

Supplementary Information:

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Warning!
This is a Class A product. In a domestic environment this product may cause radio Interference which may make it necessary for the user to take adequate measures.

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Read these safety instructions carefully before using the products mentioned in this manual:

Warranty will be void if the product is used in any way in contradiction with the instructions given in this manual or if the product has been tampered with.

The devices mentioned in this manual are to be used only according to the instructions described in this manual. Faultless and safe operation of the devices can be guaranteed only if the transport, storage, operation and handling of the devices is appropriate. This also applies to the maintenance of the products.

To prevent damage both the product and any terminal devices must always be switched OFF before connecting or disconnecting any cables. It should be ascertained that different devices used have the same ground potential. Before connecting any power cables the output voltage of the power supply should be checked.

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Revisions

Date	Document Version	Firmware Version	Description of changes
09/2008	0.1		First draft
12/2008	1.0		First version released
01/2009	1.1		Fixed operating voltage specifications
09/2010	2.0		Manual released
02/2011	3.0		Updated for a new hardware variant
04/2011	3.1		Chapters Antenna connector, SIM card slots and Configuration profiles added. Figures updated.

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1 Introduction

1.1 About the Arctic 3G Gateway

The Arctic 3G Gateway product is an industrial grade wireless router for demanding IP connectivity applications.

For the rest of this documentation, the Arctic 3G Gateway is referred to as Arctic 3G.

1.2 Arctic 3G features

Arctic 3G offers different advanced features. Flexible design allows the system to gain extra features if required.

High speed wireless connectivity
Arctic 3G has support for the latest mobile technologies, such as 3G and HSDPA. This allows the remote control of wide bandwidth services such as video surveillance or high amount of measurement and control channels.

Flexible routing
Arctic 3G can be configured to fit in all kinds of networks. It also has full support for Serial - Ethernet routing of industrial network protocols.

High security
Arctic 3G has highly configurable firewall and secure VPN support for secure connectivity.

Redundancy and reliability
Arctic 3G offers redundancy against network breakdowns and remote VPN endpoint breakdowns. This allows the overall system to achieve high availability numbers. These functionalities added to high reliability of both the hardware and software make very robust system suitable in harsh and demanding industrial environments.

Remote management
Arctic 3G can be managed remotely and it is easy to move configurations between units.

1.3 Packaging information

The product package should contain the following items:

- Arctic 3G device
- 3-pin power connector
- Antenna
- Arctic 3G Quick Start Guide

Additional accessories are available, see section 2.10.

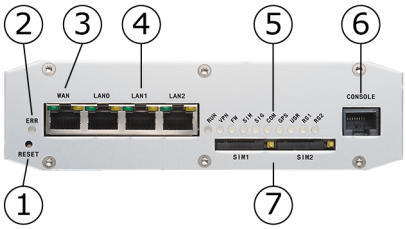
2 Hardware description

This section describes the physical interfaces on Arctic 3G.

2.1 Front panel

Arctic 3G front panel is shown in figure 1.

Figure 1. *Front Panel*



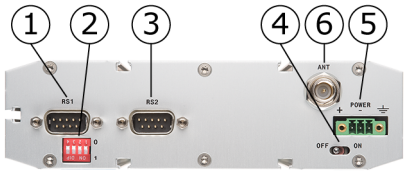
LEDs and switches (from left to right) with section reference to more detailed information:

1. Reset button (section 2.6)
2. Error LED (section 2.3)
3. Ethernet WAN port (section 2.4.2)
4. Ethernet LAN ports (section 2.4.3)
5. LEDs (section 2.3)
6. Serial console port (section 2.5.1)
7. SIM card slots (section 2.9)

2.2 Back Panel

Arctic 3G back panel is shown in figure 2.

Figure 2. *Back Panel*



Connectors (from left to right):

1. Serial port 1 (section 2.5.2)
2. Serial port 1 configuration DIP switches (section 2.5.2)
3. Serial port 2 (section 2.5.3)
4. Power switch
5. Power connector (section 2.7)
6. Antenna connector (section 2.8)

2.3 LEDs

2.3.1 Status LEDs

Arctic 3G has 11 status LEDs. They are located on the front panel (see section 2.1).

Table 1: LED Description

LED	State	Meaning
Error	On	Unit is restarting. LED should turn off after restart (usually about 30 seconds). If the LED is constantly turned on for a long time you should contact technical support.
	Blinking	There is something wrong with the unit or the power supply causes the unit to restart constantly. You should try with another power supply and if that does not help, contact technical support.
	Off	Unit is operating normally.
RUN	Blinking	Unit is operating normally
	Off	If the unit is turned on and RUN led is not blinking, the system has catched an error and is waiting for restart. The unit should restart soon.
VPN	On	VPN connection is up
	Blinking	VPN connection is starting
	Off	VPN connection is disabled
FW	-	Reserved for future use
SIM	On	SIM card has been found and it is ready for use.
	Blinking	SIM card initialization is in progress.
	Off	SIM card is not in use
SIG	On	Signal level is normal or good (better than -95 dBm)
	Blinking	Signal level is weak (between -110 dBm and -95 dBm)
	Off	There is no signal (below -110 dBm)
COM	On	3G connection is up
	Blinking	3G connection is starting. If the connection is not coming up, check the SIM and SIG LEDs
	Off	3G connection is stopped
APP	-	Reserved for future use
USR	-	Reserved for future use
RS1	-	Reserved for future use
RS2	-	Reserved for future use

2.3.2 Ethernet LEDs

All Ethernet ports have two LEDs to indicate the ports link and activity status.

Table 2: Ethernet LED description

LED	State	Meaning
Green	On	Link on
	Blink	Data received
	Off	Link off
Yellow	On	Full duplex
	Off	Half duplex

2.4 Networking

2.4.1 Mobile WAN (3G)

Arctic 3G has a high speed wireless functionality which allows the use of bandwidth demanding wireless applications. Arctic 3G supports wireless data speeds up to 7.2 Mbit/s, however the practical data transfer rates depend on SIM card speed and wireless network capacity.

Table 3: Mobile WAN (3G) specifications

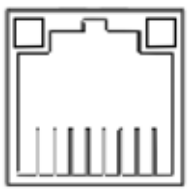
Networks	Frequencies	Maximum data rates
UMTS with HSUPA (cat 11/12)	850/900/1900/2100 MHz	7.2 Mbit/s downlink / 5.76 Mbit/s uplink
EDGE / GPRS class 10	850/900/1800/1900 MHz	216 kbps downlink/ 108 kbps uplink

2.4.2 Ethernet WAN

Arctic 3G has one physical port for Ethernet WAN. Specifications are shown in table 4.

Table 4: Ethernet WAN specifications

Figure 3. *Connector*



Number of ports	1
Speed	10Base-T, 100Base-TX
Duplex	Half and Full
Auto-negotiation	Yes

Recommended cabling	Cat5 or better

If Ethernet WAN interface is directly connected to computer, crossover cable must be used. Ethernet WAN interface does not support automatic MDI/MDIX detection.

2.4.3 Ethernet LAN

Arctic 3G has three physical ports for Ethernet LAN. These ports are connected to a common switch. Specifications are shown in table 5.

Figure 4.

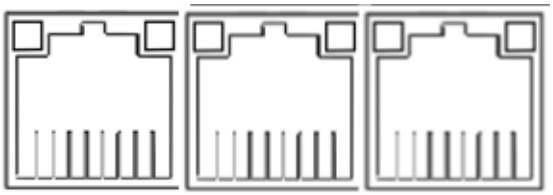


Table 5: Ethernet LAN Specificatons

Speed	10Base-T, 100Base-TX
Duplex	Half and Full
Auto-negotiation	Yes
Recommended cabling	Cat5 or better

If Ethernet LAN interface is directly connected to computer, both crossover and straight cables can be used. Ethernet LAN interface supports automatic MDI/MDIX detection.

2.5 Serial ports

Arctic 3G has two application serial ports and one serial console port.

Serial port 1 is configurable to multiple serial formats (RS-232/422/485), while serial port 2 supports only RS-232 data mode.

Serial port connectors are 9-pin D-sub (male) connectors. Serial ports enact as DTE devices.

2.5.1 Serial console port

Serial console connector is located in Arctic 3G front panel (see figure 1). Connector type is RJ45. Connector is described in table 6.

Table 6: Serial console

Figure 5. *Connector diagram*

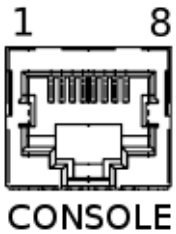


Table 7: Connector pinout

Pin	Function
1	CTS
2	DSR
3	RXD
4	GND
5	GND
6	TXD
7	DTR
8	RTS

Table 8: Serial port configuration

Baud rate	115200
Data bits	8
Parity	No parity
Stop bits	1
Flow control	No flow control

Console port can be connected from a PC by using a Cisco compatible serial console cable.

Ethernet serial console adapters are available from Viola Systems. They allow serial console access with the adapter and straight Ethernet cable. Viola Systems order code is 3170. Contact your local sales office for more details.

To open serial console access a terminal program is needed. Recommended terminal programs are Tera Term and Putty. Open the connection using the settings from table 7.

2.5.2 Serial port 1

Serial port 1 is configurable to multiple serial formats (RS-232/422/485).

Table 9: Serial port 1

Figure 6. *Connector diagram*

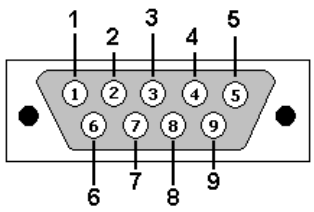


Table 10: Connector pinout (RS-232 mode)

Pin	Function
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS

Table 11: Serial port configuration

Baud rate	115 - 230400
Data bits	8
Parity	No parity
Stop bits	1
Flow control	CTS/RTS

Pin	Function
8	CTS
9	RI

DIP switch configuration for serial port 1 is described in table 12. By default all are set to "0" position (RS-232 mode). DIP switches 2-4 apply only when port is set in RS-485 mode (DIP switch 1 on "1" position).

Table 12: Serial port 1 DIP switches

Number	Function	State	Explanation
1	RS-232 / RS-485	0 = RS-232, 1 = RS-485	Selects serial port operation mode
2	FULL / HALF	0 = FULL, 1 = HALF	Selects between half (2-wire) and full duplex (4-wire)
3	BIAS	0 = OFF, 1 = ON	RS-485 biasing
4	TERMINATION	0 = OFF, 1 = ON	RS-485 termination

Warning!
Make sure you DO NOT connect RS-422 or RS-485 cables to a serial port configured to RS-232 mode. This could damage the port and the connected equipment.

Serial port pinouts in RS-422 and RS-485 modes are described in table 13.

Table 13: Serial port 1 pinouts in RS-422/485 modes

Pin	RS-485 full-duplex (4-wire)	RS-485 half-duplex (2-wire)
1	-	-
2	RXD+ (in)	-
3	TXD- (out)	TXD/RXD- (out/in)
4	-	-
5	GND	GND
6	-	-
7	TXD+ (out)	TXD/RXD+ (out/in)
8	RXD- (in)	-
9	-	-

2.5.3 Serial port 2

Table 14: Serial port 2

Figure 7. *Connector diagram*

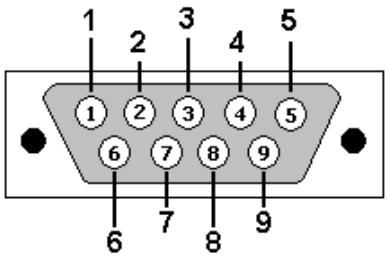


Table 15: Connector pinout

Pin	Function
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

Table 16: Serial port configuration

Baud rate	115 - 230400
Data bits	8
Parity	No parity
Stop bits	1
Flow control	No flow control

Serial port 2 supports only RS-232 data mode.

2.6 Power switch and reset button

Power switch is located on back panel. It turns the unit on and off.

Reset button is located on front panel. Press shortly to reset the unit. Reset button can be used to restore factory default settings. To restore factory default settings, reset the unit by keeping the reset button pressed down until all the status LEDs blink. This indicates the factory presets have been applied.

2.7 Power connector

Arctic 3G has a 3-pin power connector. Pinout and voltage limits are described in table 17. Supplied plug type is Phoenix Contact MC 1,5 / 3-STF-3,5 with screw fastening.

Table 17: Power supply connector

Figure 8. *Connector*

Pin	Symbol	Function
1	+	Voltage in, positive / 11 ... 18 VDC, 400 mA

Pin	Symbol	Function
2	-	Voltage in, negative
3	GND	Extra ground connection

Arctic 3G can be also used with 2-pin power connector, pin 3 left unconnected. The unit is protected against reversed polarity within the limits of the specified voltages.

Viola Systems default power supply for Arctic 3G can be ordered with order code 3020. Note that the power supply is not included in standard Arctic 3G package.

2.8 Antenna connector

The Arctic 3G has a FME antenna connector (male type) for an external antenna. It is possible to use any kind of external 50 Ω quad-band antenna.

2.9 SIM card slots

Arctic 3G wireless connection (3G) requires SIM card with data transfer service enabled. Device can use two SIM cards, which can be used to make connection to two different operators. Arctic 3G can be operated using only one SIM card.

To operate with SIM card follow the procedure below:

1. Power off the Arctic.
2. The SIM card holder contains a tray with a yellow eject button. Push this button to eject the tray from the holder.
3. Put the SIM card onto the tray.
4. Insert the tray carefully back to the holder and press the tray until it is locked.

If two SIM card are used, repeat the procedure for SIM slot 2.

Note!

It is not recommended to insert or remove the SIM card while the Arctic 3G is turned on.

2.10 DIN rail mounting

Arctic 3G has mounting holes for optional DIN rail mounting brackets. Viola Systems order code for DIN rail mounting kit is 3003. Contact your local Viola Systems distributor for more details.

Mounting instructions:

1. Required tools and accessories are: DIN rail mounting kit (2 mounting brackets and 4 screws), screw driver.
2. Use the screw driver to attach the screws to bottom panel of the Arctic 3G. DIN rail brackets can be installed to either diagonally or horisontally depending on the wanted DIN rail installation angle.

2.11 Product label

Product label is found on the bottom of the device and it contains the basic information about the unit such as product name, serial number and Ethernet MAC address.

Figure 9. *Product label*

2.12 Accessories

Viola Systems supplies certain accessories for Arctic 3G. Possible accessories are listed in table 18.

Table 18: Arctic 3G accessories

Accessory	Order code
Serial console adapter: RS232 to RJ45	3170
DIN rail monting kit: 2 DIN rail clips with screws	3003
Optional power supply: 12V/1.5A with universal 100-240VAC IEC input	3020
Accessory kit: Serial console adapter, Ethernet cables, power supply	3221

3 Quick Installation

This chapter describes how to configure the WAN network interfaces on Arctic 3G.

3.1 Connection Principle

Arctic 3G has three network interfaces, Ethenet WAN, Mobile WAN (3G) and Ethernet LAN. WAN interfaces are used for connecting Arctic 3G to public Internet or private APN. Ethernet LAN is used for connecting other Ethernet devices to Arctic 3G's local network.

WAN interfaces can be configured to get redundant system where one WAN automatically gets traffic if the other one goes down. For example, if the Ethernet LAN goes down, the traffic will be automatically switched to mobile 3G and back when the Ethernet interface comes up again. This way the availability of the remote system will be better than with just one interface.

3.2 Connecting cables

1. Verify that the power switch is in the OFF position.
2. Connect the Ethernet cable between Arctic 3G (Ethernet LAN connector) and your configuration computer.
3. Connect power supply to Arctic 3G and toggle power the switch to ON position.
4. The error LED should turn on immediately after the power switch turned on.
5. After the system has initialized, the Error LED turns off and the RUN LED starts to blink.

3.3 Logging in to Arctic 3G

This section describes how to log in to Arctic 3G using web configuration menu.

1. Configure your computer to use the same IP address space than Arctic 3G (laptop IP for example 10.10.10.11 with netmask 255.0.0.0). Check with ping command.
2. Connect to the Arctic 3G using your web browser. The default IP address of Arctic 3G is 10.10.10.10 (netmask 255.0.0.0). Note that you have to connect to a HTTPS port (see figure 13).

Figure 10. *Browser https example*

3. Your browser may mention about certificates, you can safely ignore them at this point.

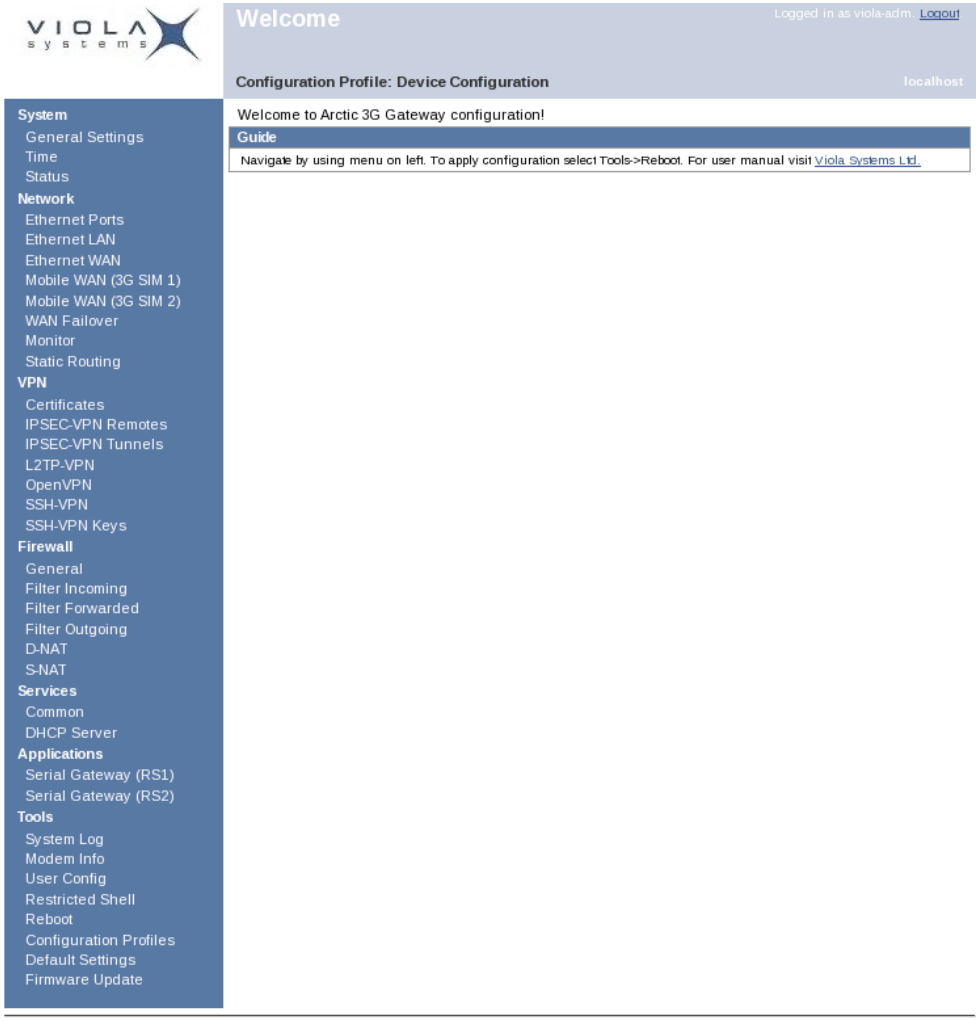
4. When you get to the login screen, enter username and password and press Login button. The actual screen depends on the used web browser.

Note!

Default username is viola-adm and default password is violam2m. It is recommended that the default password is changed before the product is connected to a public network.

5. Now you should be logged in. White texts on the blue background on the left are the primary navigation texts and they are always visible on the screen. Individual screens may have their own tabs which split the configuration fields on larger screens. See figure 14.

Figure 11. *Configuration menu*



3.4 Configuring Ethernet LAN

1. Select **Network->Ethernet LAN** from the left menu.
2. Enter your preferred configuration to the configuration fields.
3. Press Submit button on the bottom to save the settings.

4. Select **Tools->Reboot** from the left menu and press **Reboot** button to restart the unit

Note!

If you change the IP addresses, your existing web browser connection hangs up after you apply the settings, so open a new connection to the new IP address (check your Ethernet cabling)

5. Now you should be able to connect to the Arctic 3G with your new IP address.

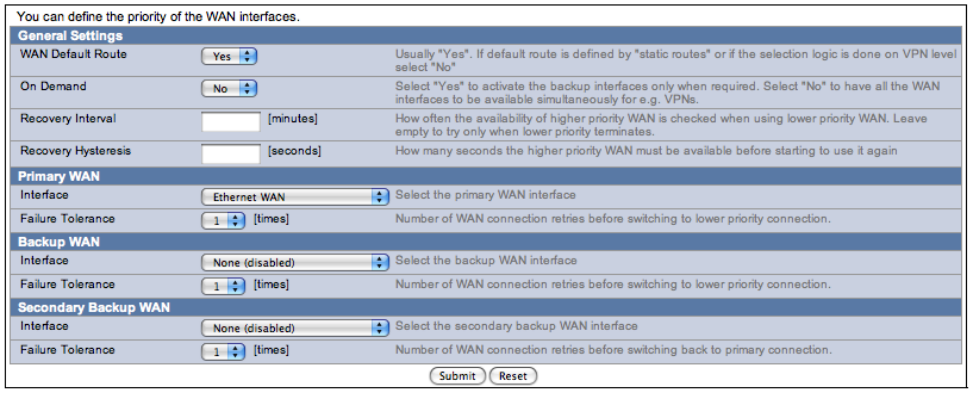
3.5 Configuring Mobile WAN (3G)

1. Select **Network->Mobile WAN (3G)** from the left menu.
2. Enter your preferred configuration to the configuration fields.
3. Press Submit button on the bottom to save the settings.

3.6 Configuring default gateway

1. Select **Network->WAN Failover** from the left menu.
2. Set **"WAN Default Route"="Yes".** This has to be enabled to use either WAN as default route interface.
3. If you want to use 3G as default gateway, set **"Primary WAN Interface"="Mobile WAN (3G)".**
4. If you want to use EthernetWAN as default gateway, set **"PrimaryWAN Interface"="EthernetWAN"**.
5. If you have both Ethernet WAN and Mobile WAN configured, you can define the Backup WAN Interface. If the primary WAN interface comes down, Arctic 3G automatically switches default route to backup WAN interface. Figure 15 shows example configuration where Ethernet WAN is configured as default route.

Figure 12. *Ethernet WAN default route example*


You can define the priority of the WAN interfaces.
General Settings
WAN Default Route
Yes
Usually "Yes". If default route is defined by "static routes" or if the selection logic is done on VPN level select "No"
On Demand
No
Select "Yes" to activate the backup interfaces only when required. Select "No" to have all the WAN interfaces to be available simultaneously for e.g. VPNs.
Recovery Interval
[minutes]
How often the availability of higher priority WAN is checked when using lower priority WAN. Leave empty to try only when lower priority terminates.
Recovery Hysteresis
[seconds]
How many seconds the higher priority WAN must be available before starting to use it again
Primary WAN
Interface
Ethernet WAN
Select the primary WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching to lower priority connection.
Backup WAN
Interface
None (disabled)
Select the backup WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching to lower priority connection.
Secondary Backup WAN
Interface
None (disabled)
Select the secondary backup WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching back to primary connection.
Submit
Reset

6. Press Submit button on the bottom to save the settings.
7. Select **Tools->Reboot** from the left menu and press **Reboot** button to restart the unit.

4 Network Configuration

4.1 Configuration screens

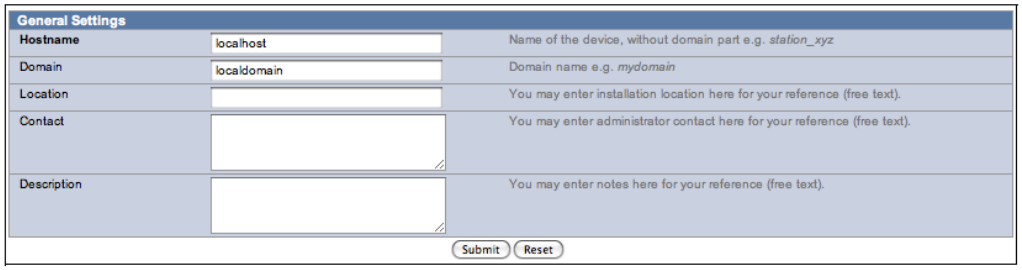
The web user interface has a navigation menu that is always visible on the left pane. In the menu, the items are grouped together in sections such as System, Network, VPN and Firewall.

Figure 13. *Web user interface*

4.1.1 Host and domain names

Host and domain names can be set from the System General Settings screen.

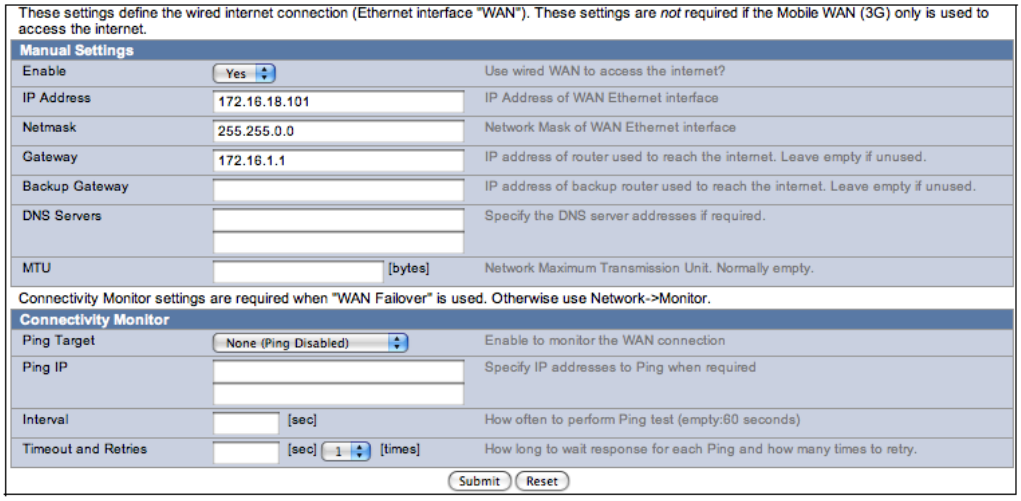
Figure 14. *General Settings*



4.1.2 Ethernet WAN

This screen configures the Ethernet WAN interface on Arctic 3G.

Figure 15. *Ethernet WAN configuration*


These settings define the wired internet connection (Ethernet interface "WAN"). These settings are not required if the Mobile WAN (3G) only is used to access the internet.
Manual Settings
Enable
Yes
Use wired WAN to access the internet?
IP Address
172.16.18.101
IP Address of WAN Ethernet interface
Netmask
255.255.0.0
Network Mask of WAN Ethernet interface
Gateway
172.16.1.1
IP address of router used to reach the internet. Leave empty if unused.
Backup Gateway
IP address of backup router used to reach the internet. Leave empty if unused.
DNS Servers
Specify the DNS server addresses if required.
MTU
[bytes]
Network Maximum Transmission Unit. Normally empty.
Connectivity Monitor settings are required when "WAN Failover" is used. Otherwise use Network->Monitor.
Connectivity Monitor
Ping Target
None (Ping Disabled)
Enable to monitor the WAN connection
Ping IP
Specify IP addresses to Ping when required
Interval
[sec]
How often to perform Ping test (empty:60 seconds)
Timeout and Retries
[sec]
1
[times]
How long to wait response for each Ping and how many times to retry.
Submit
Reset

Connectivity Monitor settings are used whenWAN redundancy functionality is wanted. Monitor keeps checking the connection to given remote host to determine the network status. If the ping does not get an answer for given time window, it informs the WAN switch logic to try the secondary interface.

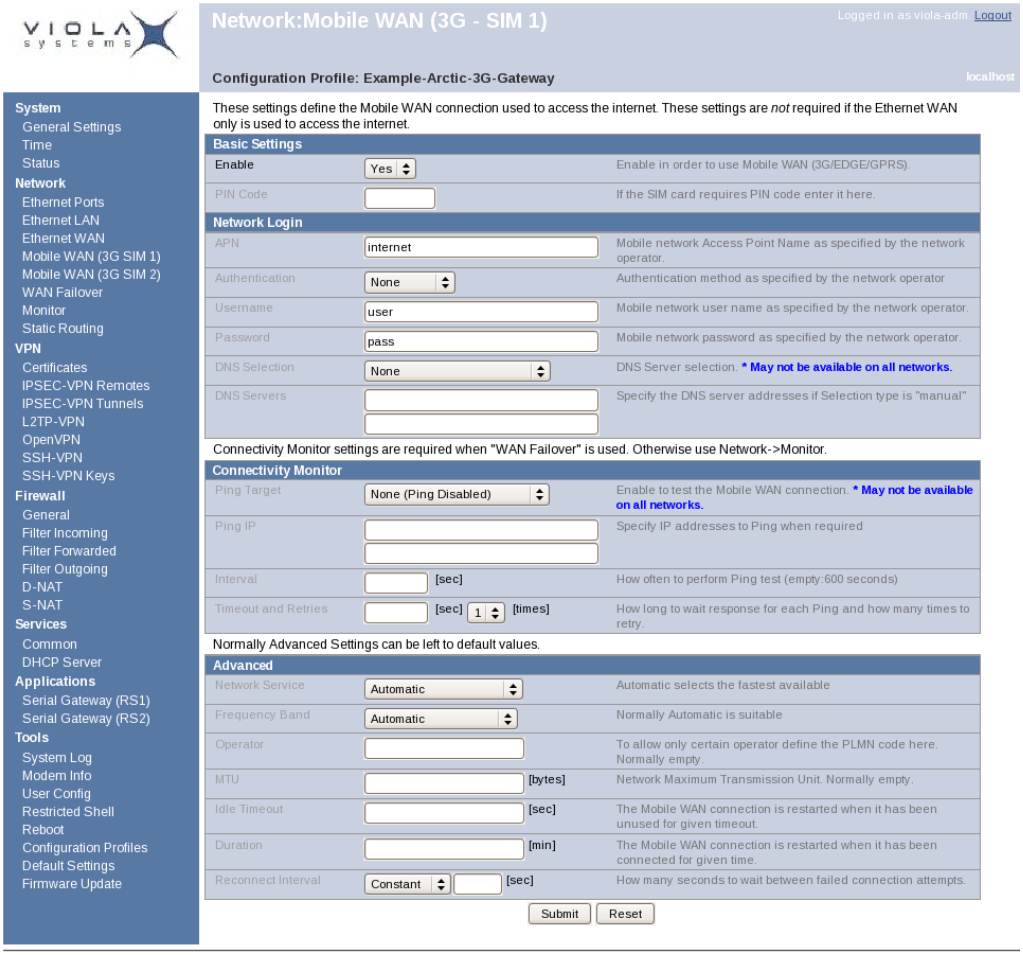
If the WAN redundancy is implemented by using two separated Ethernet connections with different gateways, the Backup Gateway parameter needs to be configured towards correct backup gateway. Backup Gateway parameter is not needed if WAN redundancy is implemented with wireless connection.

See section 4.1.4 for more details about WAN redundancy.

4.1.3 Mobile WAN (3G)

This screen configures the Mobile WAN (3G) interface on Arctic 3G.

Figure 16. *Mobile WAN configuration*



To configure the mobile WAN (3G), enable the connection by selecting "Enable"="Yes" on the top of the page and enter PIN code if set, APN name and authentication details if needed.

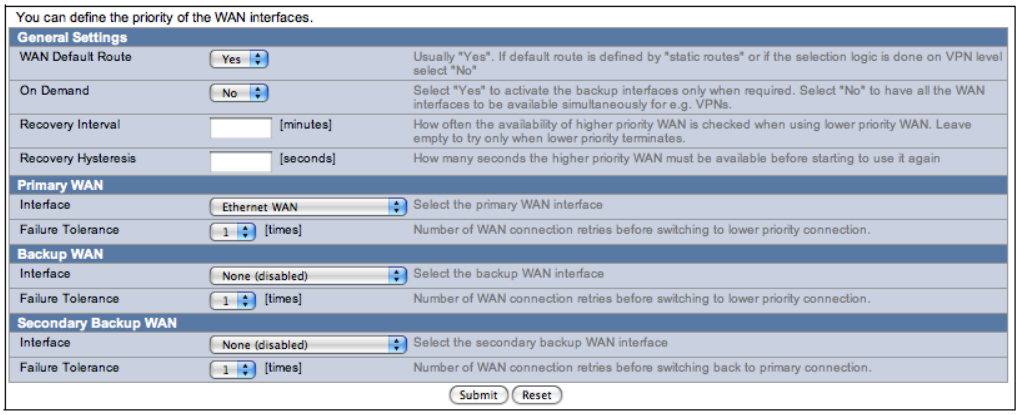
If Arctic 3G acts as a wireless router to Ethernet devices and DNS is needed, enter DNS configuration as well. When ready, press the Submit button on the bottom of the page to save settings.

Arctic 3G needs to be restarted before 3G configuration gets active.

4.1.4 WAN Failover

WAN Failover screen configures the default gateway settings on the Arctic 3G.

Figure 17. *WAN Failover configuratio*


You can define the priority of the WAN interfaces.
General Settings
WAN Default Route
Yes
Usually "Yes". If default route is defined by "static routes" or if the selection logic is done on VPN level select "No"
On Demand
No
Select "Yes" to activate the backup interfaces only when required. Select "No" to have all the WAN interfaces to be available simultaneously for e.g. VPNs.
Recovery Interval
[minutes]
How often the availability of higher priority WAN is checked when using lower priority WAN. Leave empty to try only when lower priority terminates.
Recovery Hysteresis
[seconds]
How many seconds the higher priority WAN must be available before starting to use it again
Primary WAN
Interface
Ethernet WAN
Select the primary WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching to lower priority connection.
Backup WAN
Interface
None (disabled)
Select the backup WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching to lower priority connection.
Secondary Backup WAN
Interface
None (disabled)
Select the secondary backup WAN interface
Failure Tolerance
1
[times]
Number of WAN connection retries before switching back to primary connection.
Submit
Reset

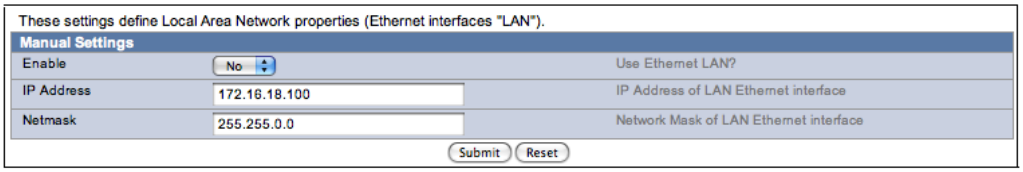
To enable any default routes, set **"WAN Default Route"="Yes"**. Any route settings are not effective if this parameter is not enabled.

Set **"On Demand"="Yes"** if you want the backup WAN interface to come up only when primary interface goes down. Disable if both wireless and wired WAN interfaces have to be up all the time.

4.1.5 Ethernet LAN

This screen configures the Ethernet LAN interface on Arctic 3G.

Figure 18. *Ethernet LAN Configuration*

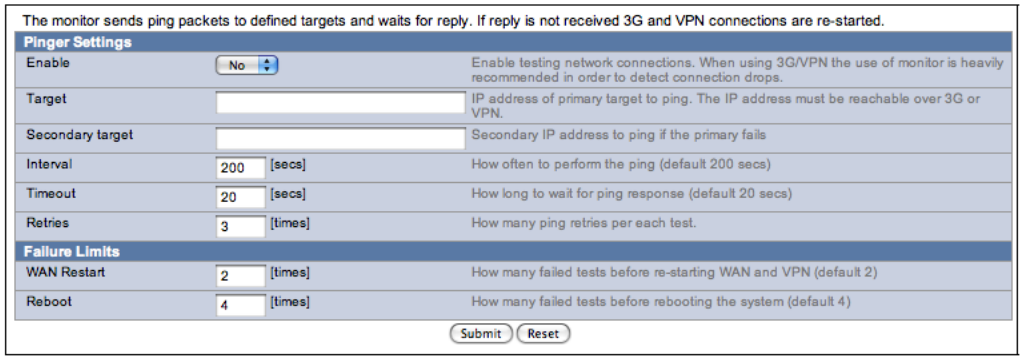


Ethernet LAN configuration is very simple. It configures the IP address for the Ethernet LAN interface.

4.1.6 Network monitor

This screen configures the interface connectivity monitor on Arctic 3G.

Figure 19. *Network monitor configuration*


The monitor sends ping packets to defined targets and waits for reply. If reply is not received 3G and VPN connections are re-started.
Pinger Settings
Enable
No
Enable testing network connections. When using 3G/VPN the use of monitor is heavily recommended in order to detect connection drops.
Target
IP address of primary target to ping. The IP address must be reachable over 3G or VPN.
Secondary target
Secondary IP address to ping if the primary fails
Interval
200
[secs]
How often to perform the ping (default 200 secs)
Timeout
20
[secs]
How long to wait for ping response (default 20 secs)
Retries
3
[times]
How many ping retries per each test.
Failure Limits
WAN Restart
2
[times]
How many failed tests before re-starting WAN and VPN (default 2)
Reboot
4
[times]
How many failed tests before rebooting the system (default 4)
Submit
Reset

When using 3G/VPN the use of monitor is heavily recommended to detect connection drops.

4.2 Routing

4.2.1 Routing parameters

There are multiple configuration options that define the routing on Arctic 3G:

- Ethernet WAN - Gateway (IP address)
  - IP address of router used to reach the internet. Leave empty if unused.
- Ethernet WAN - Backup Gateway (IP address)
  - IP address of backup router used to reach the internet. Leave empty if unused.
- WAN Failover - WAN Default Route (selection: Yes/No)
  - Usually "Yes" if default route is defined by "static routes". If the selection logic is done on VPN level select "No"
- WAN Failover - On Demand (selection: Yes/No)
  - Select "Yes" to activate the backup interfaces only when required. Select "No" to have all the WAN interfaces to be available simultaneously for e.g. VPNs.
- WAN Failover - Primary WAN Interface (selection: None/Mobile WAN/ Ethernet WAN/Ethernet WAN Secondary)
- WAN Failover - Backup WAN Interface(selection: None/Mobile WAN/ Ethernet WAN/Ethernet WAN Secondary)
- WAN Failover - Secondary Backup WAN Interface (selection: None/Mobile WAN/Ethernet WAN/Ethernet WAN Secondary)
  - These three settings configure the high level default gateways. Must be configured to enable default route.
- OpenVPN Client Settings - Interface (selection: Any WAN/Ethernet WAN/ Wireless WAN/Ethernet LAN)
  - Which Interface to use for connection
- OpenVPN Client Settings - Routing mode (selection: None/host/net/default route)
  - This defines how the routing is configured with OpenVPN. See OpenVPN application note.

4.2.2 Default route

Default route can be configured from WAN Failover screen. See section 4.1.4.

4.2.3 WAN redundancy/failover

To configure redundancy between WAN interfaces, configure multiple WAN interfaces to WAN Failover. See section 4.1.4.

4.2.4 Routing serial <-> Ethernet

See section 5.1 for configuring serial gateway.

4.3 Network services

4.3.1 DNS proxy

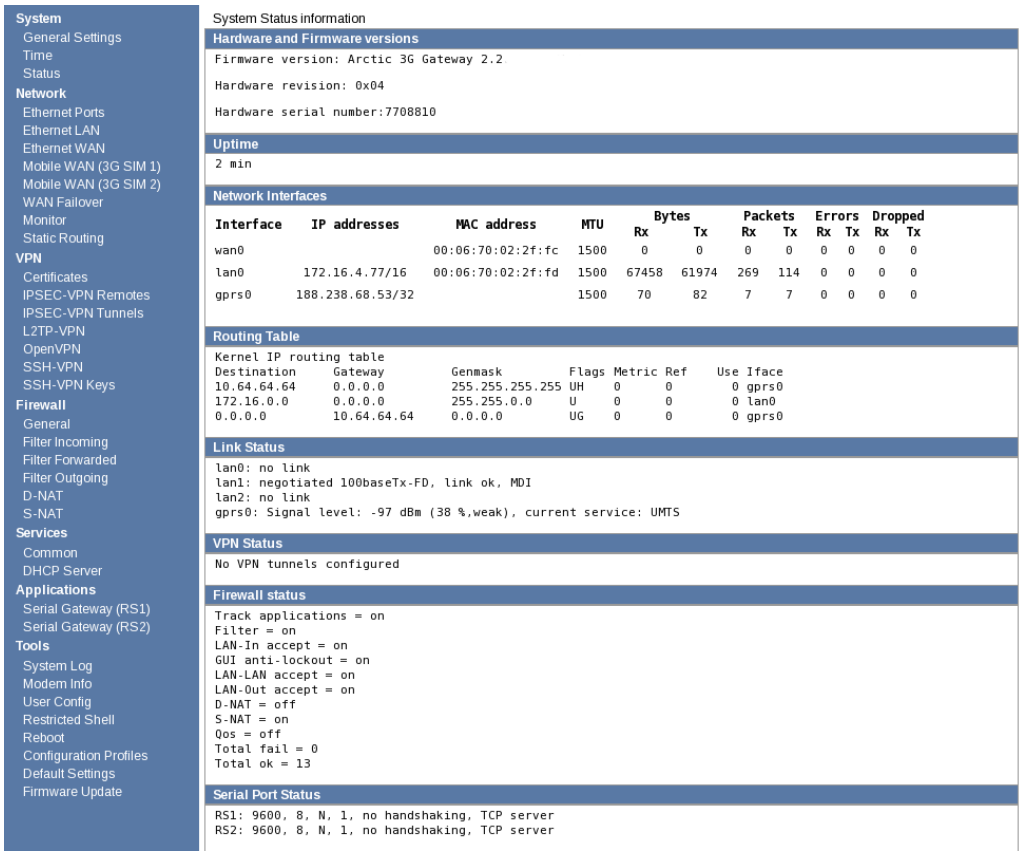
To use this feature, configure the device to use Arctic 3G Ethernet LAN IP address as its DNS server. This way the DNS queries from the device get routed thorough the Arctic 3G. To use this feature, configure the device to use Arctic 3G Ethernet LAN IP address as its DNS server. This way the DNS queries from the device get routed thorough the Arctic 3G.

4.4 Network status information

4.4.1 System status screen

Network status information can be seen from System->Status screen.

Figure 20. *Network status screen*



4.4.2 Mobile WAN (3G) status LEDs

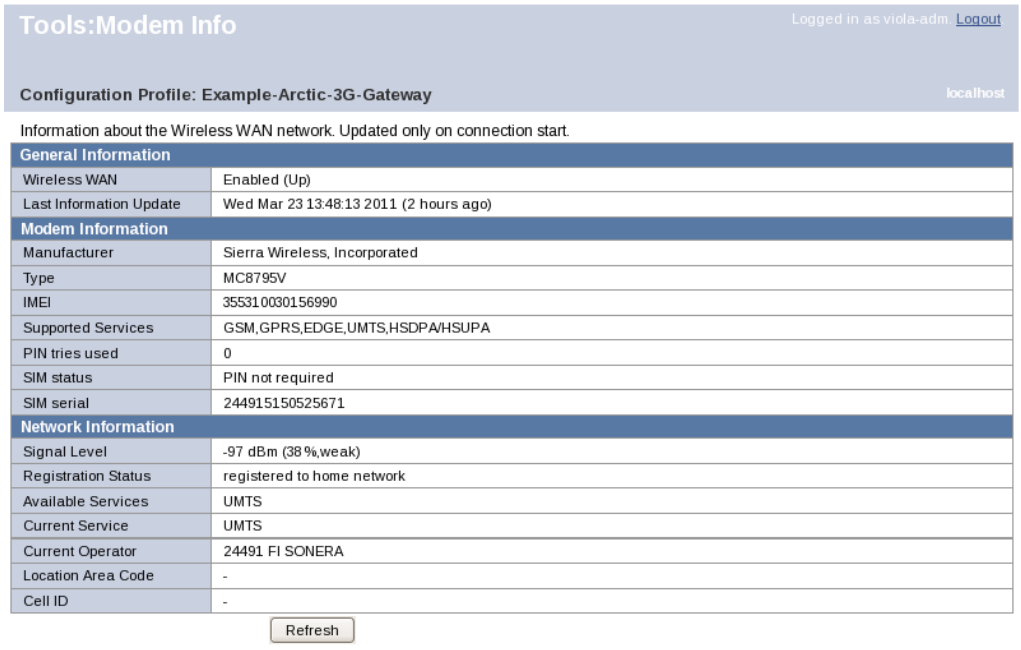
Status of mobile WAN interface can be seen from the front panel LEDs. The initialization sequence is:

1. COM LED starts to blink when the connection is started.
2. SIM LED starts to blink when SIM card is searched and turns on when card is found and PIN code accepted.
3. SIG LED starts to blink when operator network is searched and gets lit when the network is found.
4. COM LED gets lit when the connection is up.

4.4.3 Modem info screen

In troubleshooting situations, checking the system logs helps to identify the problem. Also modem info page can be used to check the status of the wireless modem.

Figure 21. *Modem info screen*



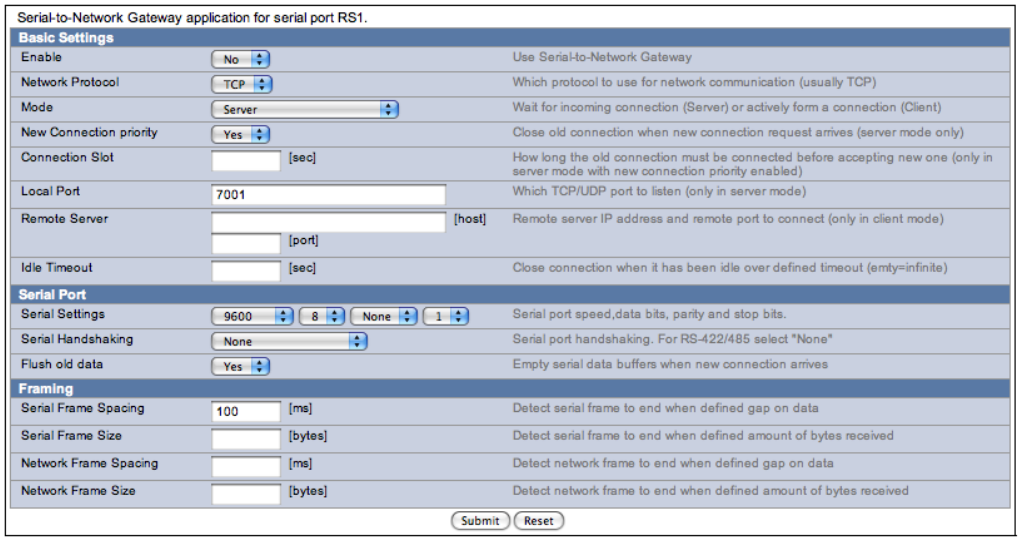
5 Serial Port Configuration

5.1 Configuring serial gateway

This section describes how to configure serial <-> Ethernet functionality.

Serial gateway feature enables data from the serial port attached device to be routed to Ethernet and vice versa. Serial gateway processes the transmitted data transparently and does not alter it any way except for buffering it for transmission. Because of the transparent communication, any protocols can be used in actual communication between nodes.

Figure 22. *Serial gateway configuration screen*



Serial gateway configuration depends on used protocols.

Both serial ports have their own configuration screens, located in **Applications->Serial Gateway (RS1)** and **Applications->Serial Gateway (RS2)**.

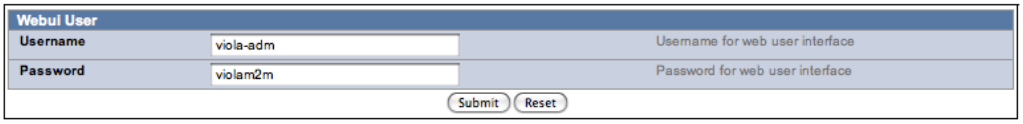
6 Additional System Configuration

6.1 Changing system password

Username and password can be changed from Tools->User Config screen. It is always recommended to change the password from the factory default when the Arctic 3G is connected to a public network.

Also console access password can be changed.

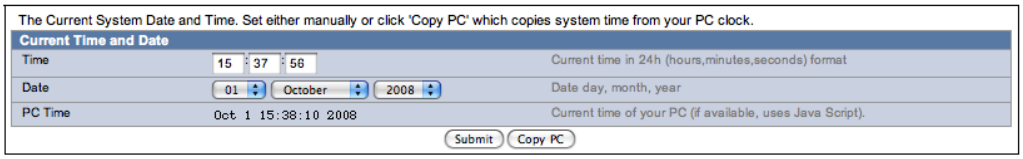
Figure 23. *User Config screen*



6.2 Date and time

Date and time can be changed from **System->Time** screen. Date and time can be configured either manually entering the time or automatically from connected PC.

Figure 24. *System time configuration screen*


The Current System Date and Time. Set either manually or click 'Copy PC' which copies system time from your PC clock.
Current Time and Date
Time
15 : 37 : 56
Current time in 24h (hours,minutes,seconds) format
Date
01
October
2008
Date day, month, year
PC Time
Oct 1 15:38:10 2008
Current time of your PC (if available, uses Java Script).
Submit
Copy PC

To set time manually, enter the time and then press Submit button.

To copy time from PC, press Copy PC button and answer "Yes" to question about changing time. Note that the PC may not necessarily have correct time set and that needs validation. Also note that the copy functionality requires JavaScript support from the browser.

6.3 System log

System log is visible on the Tools->System Log screen. To refresh the system log, use web browser reload button.

6.4 Factory default settings

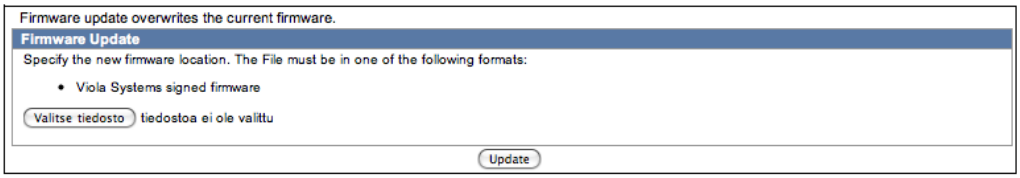
Factory default settings can be applied by restarting the unit pressing down reset button until the LEDs blink.

6.5 Firmware update

Current running firmware version can be seen from the **System->Status** screen.

Arctic 3G firmware can be updated from the **Tools->Firmware Update** screen.

Figure 25. *Firmware update screen*


Firmware update overwrites the current firmware.
Firmware Update
Specify the new firmware location. The File must be in one of the following formats:
Viola Systems signed firmware
Valitse tiedosto
tiedostoa ei ole valittu
Update

Note!

Firmware update erases all the settings on the unit to the factory defaults. It is recommended to create backup from the old configuration before attempting to update the firmware.

To update firmware:

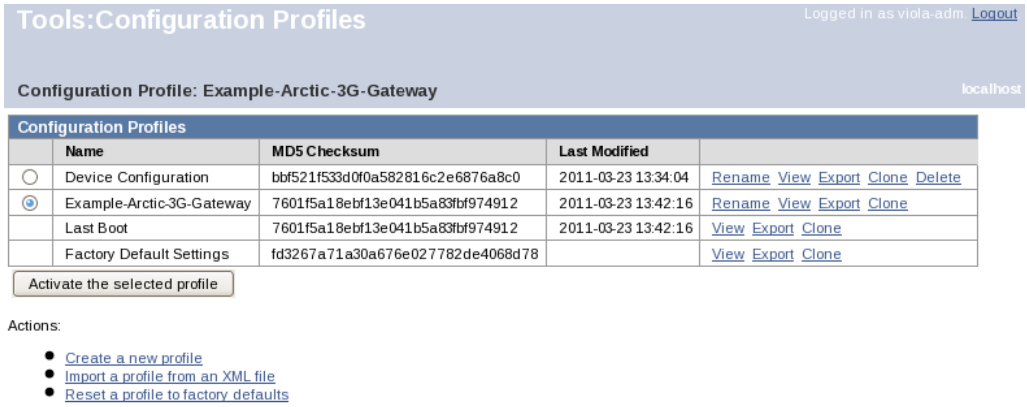
1. Verify that you have a valid firmware on your PC before you attempt to update the firmware.
2. Select **Select file** button to open file browsing dialog. The actual dialog depends on the used browser.
3. Select updated firmware from the file dialog and return to firmware update screen.
4. Press **Update** button to start the firmware update.
5. Confirm the update when asked to.

Update takes few minutes and the unit will restart with factory default settings when the update is done.

6.6 Configuration profiles

Profiles can be configured and saved for future use. You can create several different profiles and choose which one to activate. It is possible to import, export and clone profiles, and also reset them to factory default settings.

Figure 26. *Configuration profiles*



7 Troubleshooting

Q: Wireless WAN is not coming up

A: Check settings, SIM card and signal level. Easy way to check the connection status is checking the LEDs, see section 4.4.2.

Q: OpenVPN is not working

A: See OpenVPN application note for more information.

Q: Serial ports are not working

A: See serial port chapter notes. Verify DIP switch configuration if you are using RS-422 or 485 modes.

Q: Can not access web user interface

A: Web user interface uses HTTPS for secure web access and it must be specified on the web browser address field like in this example: https://10.10.10.10.

Q: Can not access the Internet with laptop connected to Arctic 3G

A: If you want to test the 3G connection:

1. Configure 3G connection and verify it connects to the network
2. Connect a laptop to Ethernet LAN
3. Check that S-NAT rule on the firewall is set as "Action"="Masquerade" and "Destination Inter- face"="Mobile WAN (3G)".
4. Check that DNS Proxy is enabled from Services->Common screen.
5. Configure network settings on laptop to use Arctic 3G Ethernet LAN address as gateway and DNS server.

With these settings you should be able to access the Internet with the laptop.

Specifications

Table 19: Technical specifications

Processor	400MHz
Memory	64MB
Hard Drive	32MB flash
Input voltage (nominal)	12-36VDC
Power consumption	7W max
Power connector	Phoenix Contact MC 1,5/ 3-STF-3,5
Casing	Aluminium sheet
Operating temperature	-25 - 70 °C
Storage temperature	-40 ... +85 C
Humidity	0 ... 99 % non-condensing
Network connection	10/100M
Approvals	CE
Size	165 x 120 x 46 mm
Weight	0.6 kg

Table 20: Wireless specifications

Networks	Frequencies	Maximum data rates
UMTS with HSUPA (cat 11/12)	850/900/1900/2100 MHz	7.2 Mbit/s downlink / 5.76 Mbit/s uplink
EDGE/GPRS class 10	850/900/1800/1900 MHz	216 kbps downlink/ 108 kbps uplink

Antenna connector type is SSMB-nano.

Table 21: Application serial port specifications

Serial mode (RS1)	RS-232 / 422 / 485
Serial mode (RS2)	RS-232
Baud rate	300 - 460800
Data bit	5 / 6 / 7 / 8
Parity	None / Even / Odd
Stop bits	1 / 2
Flow control	None / Hardware (RTS/CTS) / Software (XON/ XOFF)

Techical specifications can be changed without notification.

Limited Warranty

Coverage

Viola Systems warrants this hardware product to be free from defects in materials and workmanship for the warranty period. This non-transferable, limited warranty is only to you, the first end-user purchaser. The warranty begins on the date of purchase and lasts for the period specified below:

Arctic 3G Gateway : one (1) year

Excluded Products and Problems

This warranty does not apply to: (a) Viola Systems software products; (b) expendable components such as cables and connectors; or (c) third party products, hardware or software, supplied with the warranted product. Viola Systems makes no warranty of any kind on such products which, if included, are provided "AS IS." Excluded is damage caused by accident, misuse, abuse, unusually heavy use, or external environmental causes.

Remedies

Your sole and exclusive remedy for a covered defect is repair or replacement of the defective product, at Viola Systems' sole option and expense, and Viola Systems may use new or refurbished parts or products to do so. If Viola Systems is unable to repair or replace a defective product, your alternate exclusive remedy shall be a refund of the original purchase price.

The above is Viola Systems' entire obligation to you under this warranty. IN NO EVENT SHALL VIOLA SYSTEMS BE LIABLE FOR INDIRECT, INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, USE, OR PROFITS EVEN IF VIOLA SYSTEMS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. In no event shall Viola Systems' liability exceed the original purchase price of the device server. Some states or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Obtaining Warranty Service

You must notify Viola Systems within the warranty period to receive warranty service. During the warranty period, Viola Systems will repair or replace, at its option, any defective products or parts at no additional charge, provided that the product is returned, shipping prepaid, to Viola Systems. All replaced parts and products become the property of Viola Systems. Before returning any product for repair, customers are required to contact the Viola Systems.

Technical Support

Contacting Technical Support

Phone: +358 20 1226 226

Fax: +358 20 1226 220

E-mail: support@violasystems.com

Internet: http://www.violasystems.com

Recording Arctic Information

Before contacting our Technical Support staff, please record (if possible) the following information about your Arctic product:

Product name:

_____

Serial no:

_____

Note the status of your Arctic in the space below before contacting technical support. Include information about error messages, diagnostic test results, and problems with specific applications.

_____

_____

_____